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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/767,394	01/28/2004	A. Mufit Ferman	SCK7146.0186	4757

			EXAMINER

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ART UNIT	PAPER NUMBER
2609	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/22/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

	Application No.	Applicant(s)
Office Action Summary	10/767,394	FERMAN ET AL.
	Examiner	Art Unit	
	Amara Abdi	2609	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 January 2004*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13,15,19-22,25 and 26* is/are rejected.

7)☒ Claim(s) *14,16-18,23 and 24* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 August 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-SB/08)
Paper No(s)/Mail Date *01/28/2004*.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

Specification

1.   The abstract of the disclosure is objected to because it is short.

Applicant is reminded of the proper language and format for an abstract of the

disclosure.

The abstract should be in narrative form and generally limited to a single
paragraph on a separate sheet within the range of 50 to 150 words. It is important that
the abstract not exceed 150 words in length since the space provided for the abstract
on the computer tape used by the printer is limited. The form and legal phraseology
often used in patent claims, such as "means" and "said," should be avoided. The
abstract should describe the disclosure sufficiently to assist readers in deciding whether
there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information
given in the title. It should avoid using phrases which can be implied, such as, "The
disclosure concerns," "The disclosure defined by this invention," "The disclosure
describes," etc.

Correction is required. See MPEP § 608.01(b).

2.   On page 5, line 2, "it the distribution" should be changed to "if the distribution ".

Appropriate correction is required.

Claim Objections

3.   Claims 2-6,8-9,11-12, and 14-24 are objected to because of the following

informalities:

(1) Claim 2, line 1, "**an image**" should be changed to "**the** image", the same

informality was found in the following claims: **claim 3**, line 1, **claim 4**, line 1, **claim 5**,

line 1, **claim 6**, line 1, **claim 8**, line 1, **claim 9**, line 1, **claim 11**, line 1, **claim 12**, line 1,

claim 14, line 1, **claim 15**, line 1, **claim 16**, line 1, **claim 17**, line 1, **claim 18**, line 1,

claim 19, line 1, **claim 20**, line 1, **claim 21**, line 1, **claim 22**, line 1, **claim 23**, line 1 and

claim 24, line 1.

(2) Claim 15, line 2, the examiner suggest inserting "**an**" between "**to**" and

"**image**" for clarification,

(3) Claim 17, line 2, "**a** background" should be changed to '**the** background"

(4) Claim 20, line 4, "**a** region" should be changed to "**the** region", and

"**a** contone" should be changed to "**the** contone".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter, which the applicant regards as his invention.

2.   Claims 10,11,12,13 and 14 are rejected under 35 U.S.C. 112, second paragraph,

as being indefinite for failing to particularly point out and distinctly claim the subject

matter which applicant regards as the invention.

Where applicant acts as his or her own lexicographer to specifically define a term

of a claim contrary to its ordinary meaning, the written description must clearly redefine

the claim term and set forth the uncommon definition so as to put one reasonably skilled

in the art on notice that the applicant intended to so redefine that claim term. *Process*

Control Corp. v. HydReclaim Corp., 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed.

Cir. 1999). The term "**a local discriminating feature**" in claims 10,11,12,13 and 14 is

used by the claim to mean "kind of devise used in the image selected from the group

consisting of standard deviation and spread", while the accepted meaning is "**a local**

discriminating structure". The term is indefinite because the specification does not

clearly redefine the term.

Claim Rejections - 35 USC § 101

6.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7.   Claim 26 is rejected under U.S.C. 101 because the claimed invention is directed

to non- statutory subject matter.

In claims 26 a "computer readable medium" is being recited.

However, the specification, at page 5 defines the claimed computer readable medium

as **non-statutory** subject mater such as an algorithm, which may be implemented as a

programmed computer.

The computer program would reasonably be interpreted by one of ordinary skill in the

art as software, pre se. This subject matter is not limited to that which falls within a

statutory category of invention because it is limited to a process, machine, manufacture,

or a composition of matter. Software is a function descriptive material and function

descriptive material is non-statutory subject matter.

Claim Rejections - 35 USC § 102

8.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> (e) the invention was described in a patent granted on an application for patent by another filed in the
> United States before the invention thereof by the applicant for patent, or on an international application
> by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this
> title before the invention thereof by the applicant for patent.

9.   Claims 1,2,3,4,5,6,25 and 26 are rejected under 35 U.S.C. 102(e) as being

anticipated by Fan et al. (US 6,973,213)

        (1) Regarding claims 1 and 26:

As shown in figure 3, Fan et al. disclose image segmentation method and program

(column 4, line 6-8), (the examiner interpreted the use of algorithm is inherent to a

computer-readable medium) comprising:

a) obtaining pixel attribute data for a mixed-content image (column 3, line 22); b)

identifying a text region in said image (column 3, line 24-25); c) identifying a background

region in said image (column 3, line 24); d) analyzing areas in said image outside any of

said background regions and outside any of said text regions to identify contone regions

(column 3, line 28-29); e) analyzing said contone regions to identify any text regions

present within said contone regions (column 3, line 32-33); f) analyzing said contone

regions to identify any background regions present in said contone regions (column 3,

line 31); g) analyzing areas in said contone regions outside any of said background

regions and outside any of said text regions to identify contone sub-regions (column 3,

line 36-38); and h) repeating steps e-g until no further sub-regions are found (column 3,

line 38-40). (Column 3, line 18-40), (the examiner interpreted that the concept of the

invention is the same)

(2) Regarding claim 2:

An image segmentation method further comprising analyzing said contone regions and said contone sub-regions to identify pictorial contone regions (column 3, 36-37)

(3) Regarding claim 3:

An image segmentation further comprising filtering said pixel data to remove noise (column 3, line 20-22)

(4) Regarding claim 4:

An image segmentation method further comprising morphological processing of any of said text regions and any of said background regions to eliminate small isolated regions (column 4, line 29-41)

(5) Regarding claim 5:

An image segmentation method further comprising connected component labeling (306 in figure 3, column 3, line 25-26), (the examiner interpreted labeling as classifying)

(6) Regarding claim 6:

An image segmentation method further comprising computing a bounding box for a region (column 3, line 49-52)

(7) Regarding claim 25:

As shown in figure 3, Fan et al. disclose the image segmentation method, which is inherent to the image segmentation apparatus of claim 25, the apparatus comprising:

a) a reader for obtaining pixel attribute data for a mixed-content image (column 3, line 22), b) a text identifier for identifying a text region in said image (column 3, line 24-25), c) a background identifier for identifying a background region in said image (column 3,

line 24), d) a contone analyzer for analyzing areas in said image outside any of said

background regions and outside any of said text regions to identify contone regions

(column 3, line 28-29), e) wherein said text analyzer may analyze said contone regions

to identify any text regions present within said contone regions (column 3, line 32-33);

f) wherein said background analyzer may analyze said contone regions to identify any

background regions present in said contone regions (column 3, line 31),

g) wherein said contone analyzer may analyze areas in said contone regions outside

any of said background regions and outside any of said text regions to identify contone

sub-regions (column 3, line 36-38); and

h) wherein said text analyzer, said background analyzer and said contone analyzer may

operate recursively on regions and sub-regions, to identify nested regional attributes

(column 1,line 14-15), (column 5, line 18-20, line 29-31 and line 36-38), (column 6, line

24-25), (the examiner interpreted that the text analyzer, background analyzer and the

contone analyzer operate relatively to the region and sub region proprieties to fit

completely together or with one to another).

Claim Rejections - 35 USC § 103

10.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

11.   Claims 7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Fan et al. in view of Loce et al. (US 6,449,396)

(1) Regarding claim 7:

Fan et al. disclose an image segmentation method as in claims 1,2,3,4,5,6,25 and 26

above. Also Fan et al. disclose that each pixel value is a set of color space coordinate in

a "color coordinate form" (column 4, line 4-5), which is interpreted by the examiner as a

hue. Furthermore, Fan et al. disclose the identification of the background region in an

image, which is interpreted by the examiner as the same as the identification of the

background region in luminance histogram, (the same method) (column 3, line 24-26)

However, Fan et al. does not disclose downsampling the pixel data as recited in claim 7.

However, Loce et al. teaches a method of downsampling the pixel data (column 5, line

43-47), (the examiner interpreted that the halftone process operated in the pictorials

data has the same function as downsampling of the pixel data since it reduces the

number of the bits in pixels after the process).

One of ordinary skill in the art would have clearly recognized the conversion of an image

data having M bits/pixel into halftone representation N bits/pixel where (1<N<M)

(column 5, line 45-47). Therefore it would have been obvious to one of ordinary skill in

the art at the time of invention to include the method of Loce et al. of downsampling the

pixel data in the system of Fan et al. because such feature will improve the efficiency of

filtering process in next step by making the rate of number of pixels to be filtered down

and that will reduce the noise and objectionable image artifacts (column 5, line 39-40).

(2) Regarding claim 9:

Fan et al. further disclose an image segmentation method wherein said morphological

processing is opening (column 4, line 29-41)

12.   Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fan et al.

and Loce et al. as applied in claim 7 above, and further in view of Gill et al. (US

6,952,502)

Fan et al. disclose an image segmentation method as in claim 7 above.

Furthermore, Fan et al. disclose that the image segmentation method comprises the

morphological processing (column 4, line 29-41).

However, Fan et al. does not disclose that the morphological processing is erosion as

recited in claim 8.

However, Gil et al. teaches a method comprises the data filtering and mathematical

morphology of an image processing using filters such as erosion (column 1, line 11-15).

One of ordinary skill in the art would have clearly recognized the usage of erosion of

images in an image analysis (column 1, line 18-19). Therefore it would have been

obvious to one of ordinary skill in the art at the time of invention to include the method of

Gil et al. where the morphological processing is erosion in the system of Fan et al.

because such feature is capable of producing minimal filter output and maximal filter

output by computing morphological minimal and maximal values per point of given data

by comparing two successive data inputs to find a minimum and maximum (column 5,

line 50-52), as well as efficiently computing morphological opening and closing filter

(column 4, line 11-12).

13.   Claims 10,11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Fan et al. in view of Kadtke et al. (US 6,564,176)

Fan et al. disclose an image segmentation method as in claim 7 above.

However, Fan et al. does not disclose the computing of local discriminating feature to

identify the text region in the image as recited in claim 10, where the local discrimination

feature is a standard deviation as recited in claim 11 and spread as recited in claim 12.

However, Kadtke et al. teaches a signal detection and classification technique such as

mean discrimination statistic (MDS) (column 8, line 1), where the discriminating feature

is spread (column 7, line 46) and standard deviation (column 10, line 38).

One of ordinary skill in the art would have clearly recognized the mean discrimination

statistic (MDS) (column 10, line 38), where the statistical distance express the

distribution separation in terms of standard deviation (column 10, line 37), and noise will

spread out the distribution, which then contain information about this effect (column 7,

line 45-47). Therefore it would have been obvious to one of ordinary skill in the art at the

time of invention to combine the signal and pattern detection technique of Kadtke et al.

in the system of Fan et al. because such feature provides robust decision criteria for a

wide range of parameters and signals (images) strongly in the presence of noise and

interfering signals (see abstract), as well as it's a good method of a signal processing

and time series analysis where deterministic signals are desired to be detected and

classified (column 2, line 1), which can be used in variety of applications such as:

Sonar, Radar, seismic, acoustic, electromagnetic and optic (column 1, line 65-67).

14.   Claims 13,14,15,16,17,19,20,21 and 22 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Fan et al. and Kadtke et al. as applied in claims 10-11 above,

and further in view Horie (US 6,628,833)

        (1) Regarding claim 13:

Fan et al. and Kadtke et al. disclose an image segmentation method as in claims 10,11

and 12 above.

However, Fan et al. and Kadtke et al do not disclose:

1) the identification of the region as text when the local discriminating feature is above

the local threshold value as recited in claim 13-d),

2) the identification of the background region when the highest number of pixels

exceeds a background threshold value and verifying the background region using

chrominance data as recited in claim 13-e) and f).

Horie teaches an image processing method, where the text region is identified (figure

24, column 9, line 46-51), and analyzing the luminance histogram to identify the

background region (figure 25, column 9, line 62-67) using chrominance data (column 8,

line 45-49)

One of ordinary skill in the art would have clearly recognized the identification of text

region, and analyzing the luminance histogram to identify the background (column 9,

line 46-67) region using chrominance data (column 8, line 45-49). Therefore it would

have been obvious to one of ordinary skill in the art at the time of invention to combine

the image processing method of Horie in the system of Fan et al. because such feature

improves the picture quality of the input image using a digital camera or an image

scanner (column 1, line 19-20), as well as it provides an image in which a combination of text and an image or non image area including background are accurately distinguished from one another.

(2) Regarding claim 14 and 16:

Fan et al. and Kadtke et al. disclose an image segmentation method as in claims 10,11,12 and 13 above.

However, Fan et al. and Kadtke et al. do not disclose that local feature is standard deviation with a threshold value of 32 as recited in claim 14, and the image segmentation method where the background threshold value is 12.5% of the image size as recited in claim 16.

Horie teaches an image processing method using a standard deviation where the threshold value is calculated, and the background threshold value is calculated based on the image size (114 in figure 3, column 5, line 22-24). (The examiner interpreted that the threshold value of 32 and the background threshold value of 12.5% of the image size as a design choice, and the calculation of threshold is well known by ordinary skill in the art)

One of ordinary skill in the art would have clearly recognized that usage of standard deviation to calculate threshold (Abstaract, 114 in figure 3, column 5, line 22-24). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the image processing method of Horie in the system of Fan et al. because such feature efficiently enhancing document image having color text, as well

as expecting a good quality of printed text, where the text of printed document will have a smooth and sharp edge.

(3) Regarding claim 15:

Fan et al. further disclose the image segmentation method where the background threshold value is related to the image size (column 4, line 9, line 15-18 and line 21-23), (the examiner interpreted the bounding area as the image size which related to the background threshold)

(4) Regarding claim 17:

Fan et al. and Kadtke et al. disclose an image segmentation method as in claims 10,11,12 and 13 above.

However, Fan et al. and Kadtke et al. do not disclose the identification of the background region is independent of the image element color as recited in claim 17.

Horie teaches an image processing method where the identification of the background region is independent of the image element color (column 7, line 50-51). (The examiner interpreted the image element color as the density of the photograph region).

One of ordinary skill in the art would have clearly recognized that the identification of the background region is independent of the density of the photograph region (column 7, line 49-52). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the image processing method of Horie in the system of Fan et al. because in such feature the influence in the brightness of the illumination during images pickup, difference in sheet quality, or the like can be accommodated. Her

the document image background in the region excluding the text, photograph from the document image. (Column 7, line 57-61)

(5) Regarding claim 19:

Fan et al. further disclose the image segmentation method where the identification of a background region further comprises the use of a chroma foreground and a hue foreground (column 4, line 9-13), (the examiner interpreted the use of the dynamic ranges of the three-color channels as the use of chroma foreground and a hue foreground)

(6) Regarding claim 20:

Fan et al. further disclose the image segmentation method where the identification of contone regions comprises analyzing luminance histogram bins to determine the number of bins (Npop) containing more pixels than contone threshold value (column 4, line 57-62), (the examiner interpreted that edge detection by determination the ratio of soft edge point to the strong edge point has the same function as analyzing luminance histogram bins), where a region is considered the contone region when (Npop) exceeds a uniformity threshold value (column 4, line 62-64)

(7) Regarding claim 21:

Fan et al. further disclose the image segmentation method where the analysis to identify contone region comprises verification using region properties (column 1,line 14-15), (column 5, line 18-20, line 29-31 and line 36-38)

(8) Regarding claim 22:

Fan et al. further disclose the image segmentation method where the region properties comprises area (column 4, line 19-23)

Allowable Subject Matter

15.   Claims 18,23 and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

16.   The following is a statement of reasons for the indication of allowable subject matter:

Claim 18 is allowable since the prior art of record does not teach or suggest that the identification of a background region further comprises progressively expanding the background region beyond the initial maximum histogram bin into neighboring histogram bins when the neighboring histogram bins contain a sufficient number of pixels.

Claim 23 is allowable since the prior art of record does not teach or suggest that the region is not regarded as contone when its area is smaller than the square of one tenth of the page width.

Claim 24 is allowable since the prior art of record does not teach or suggest that the analyzing to identify pictorial contone regions comprises eliminating the two-histogram bins containing the highest number of pixels and analyzing the remaining bins for bi-modal distribution.
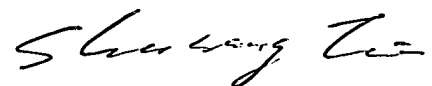
Conclusion

17.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hahn (US 6,985,612) discloses computer system and method for segmentation of a digital image.

18.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amara Abdi whose telephone number is (571) 270-1670. The examiner can normally be reached on Monday through Friday 7:30 Am to 5:00 PM E.T..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571) 272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system.   Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Amara Abdi
02/05/2007

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